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14. ABSTRACT

The current study examines the effects of a psychological intervention that encourages emotional expression in ovarian cancer patients and their partners. Ovarian cancer patients (n=130) and their partners are randomly assigned to an intervention or a control group. Following Pennebaker's model, subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for three consecutive days. The control group is asked to write about trivial non-emotional topics. Outcome variables including psychological distress, quality of life, and physical symptoms is assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months).

In accordance with our approved Statement of Work data collection is currently underway. 88 subjects completed the data collection process. Data processing is completed, including data entry and verification. Preliminary data analyses are ongoing.

15. SUBJECT TERMS
Quality of life, psychosocial intervention, stress

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Introduction

The current study examines the effects of a psychological intervention that encourages emotional expression in ovarian cancer patients and their partners. Ovarian cancer patients and their partners are recruited at Chicago area hospitals. Eligibility of patients includes ability to read and write in English, absence of any concurrent chronic condition or concurrent or prior history of psychiatric disorders, and having a spouse or partner. Patients are recruited between two months to five years after diagnosis, and after completion of active cancer treatment (e.g., surgery, radiation). They are also asked for permission to contact their spouse or partner for recruitment into the study. As it is our goal to recruit a partner for each patient to maximize effectiveness of the intervention, the only exclusion criteria for patients' partners will be inability to read and write in English or any psychiatric disorder that would preclude participation. Patients and their partners are randomly assigned to an intervention or a control group. Subjects in the intervention group are asked to write about their deepest thoughts and feelings regarding their cancer experience for 20 minutes each day for three consecutive days. The control group is asked to write about trivial non-emotional topics. *Intervention Group*: Subjects are told to write continuously for 20 minutes about their deepest thoughts and feelings about their cancer experience (spouses/partners will write about how they have been affected by the patient's illness), and about how it relates to other aspects of their lives, e.g., their family life, relationship with their spouse, sexuality, daily activities, work, social life, etc. The instructions are designed such that subjects will feel free to write about the aspects of their experience that are important to them. To encourage emotional expression, it is emphasized that their writing samples will be kept completely confidential and anonymous and will only be identified by the participant's number, not their name. The essays will later be processed by independent blind readers who have no knowledge of the participant's identity or group assignment. Finally, participants are told to not worry about style, grammar, or spelling and that no feedback will be provided to them regarding the contents of the essays. *Control Group*: Procedures follow standard protocols used in previous research. Subjects are asked to write for 20 minutes each day about a trivial non-emotional topic that is assigned to them (e.g., description of their routine daily activities). Subjects will be told to remain factual and not add any emotional content. All other procedures will be identical to the Intervention Group.

Outcome variables including psychological distress, quality of life, and physical symptoms are assessed at baseline and over a period of nine months after the intervention (one week, three, six, and nine months).

Specific Aim I: To examine the effectiveness of the emotional writing intervention for patients and their partners. **Specific Aim II:** To examine mechanisms for the effects of expressive writing. **Specific Aim III**: To begin to identify those individuals who will be most likely to benefit from this type of intervention.

Body

Timeline:

Task 1: Preparation for the study (month 1 to 2):

Completed

Task 2: Data collection (month 2 to 36):
Completed

Task 3: Data processing (month 6 to 36):
Completed

Task 4: Data analyses (month 34-36):
Main analyses have been completed. In addition, several manuscripts have been published combining this dataset with our comparable study of prostate cancer patients

Key Research Accomplishments

- Data have been collected on 88 participants who completed the entire protocol.
- Data have been analyzed to address main research hypotheses as well as additional hypotheses as detailed below.

Personnel: Sandra Zakowski, Virginia Boquiren, Sara Dittoe, Michele Herzer, Brian Schmaus, Angela Fidler and Noelle Pontarelli have received pay from the research effort.

Reportable Outcomes

The following aims are addressed below:
Specific Aim I: To examine the effectiveness of the emotional writing intervention for patients and their partners. **Specific Aim II:** To examine mechanisms for the effects of expressive writing. **Specific Aim III**: To begin to identify those individuals who will be most likely to benefit from this type of intervention.
Patients' were between 24 and 84 years old (M=57.92, SD=12.85), 97.70% were Caucasian, 70.5% currently married, 48.3% currently employed, and 33.3% had at least a college education.
First we examined whether there were any significant differences in demographic variables between conditions using ANOVA or chi-square analyses as appropriate. No significant differences emerged between conditions on any of the demographic variables (all p's>.05). There were also no significant baseline distress or personality differences across conditions. Therefore, none of the background variables were included as covariates in the analyses.
Manipulation Check
A manipulation check was included in order to verify the effectiveness of and subjects' compliance with the writing instructions. At the end of each writing session subjects rated how personal the essay was and to what extent they revealed their emotions in the

essay. Total scores were examined collapsing across the three writing sessions revealing a significant condition effect on both sets of ratings, $F(1,84)=23.48$, $p<.001$, and $F(1,84)=33.42$, $p<.001$ respectively suggesting that the manipulation was effective.

Specific Aim I: To examine the effectiveness of the emotional writing intervention for patients and their partners.

there were no significant main effects for writing condition at follow-up.

Specific Aim II: To examine mechanisms for the effects of expressive writing.

Due to the lack of a condition main effect on this sample, mediators cannot be identified on the main effects, however we did examine mediators of the interaction effect (see below).

Specific Aim III: To begin to identify those individuals who will be most likely to benefit from this type of intervention.

Multiple regression analyses revealed individual differences regarding the benefits of the writing intervention:

<u>Moderating role of Neuroticism</u>

Multiple regression analysis entering Baseline Distress, Neuroticism, Condition, and the Condition by Neuroticism (N) crossproduct showed a significant main effect of baseline distress, $F(1,86)=90.88$, $p<.001$ and a significant Condition x Neuroticism interaction $F(1,83)=15.41$, $p<.001$ on distress at follow-up. As reported previously, there was no significant main effect of writing condition (Zakowski, et al., 2004). Regression lines plotted in accordance with recommendations by Aiken and West (1991) revealed that participants low on N exhibited reduced distress six months after writing about their cancer while participants high on N exhibited high levels of distress. Participants in the control condition reported distress levels that were in between irrespective of level of N (see Figure 1). This was confirmed when examining simple slopes (Aiken & West, 1991) which revealed a significant regression of distress on neuroticism in the experimental condition, $t=3.10$, $p=.004$, but no significant effect in the controls.

Next we examined whether hi N individuals would use more avoidant coping after emotional disclosure by conducting similar multiple regression analysis. Again there was a significant relationship between baseline avoidance and avoidance post-writing, $F(1,86)=34.81$, $p<.001$ and a significant N x Condition interaction, $F(4,87=11.42$, $p=.001$. Regression plot revealed that results were in the expected direction, with participants high on N reporting the highest levels of avoidance ofcancer-related reminders. Simple slope analysis revealed a significant positive relation between N and avoidance in the experimental condition, $t=3.36$, $p=.002$ and a non-significant effect in Controls.

Testing the hypothesis that high N individuals would report more negative mood after emotional disclosure we conducted a multiple regression analysis with change in negative mood from pre- to post-writing across the three writing days as the dependent variable. In addition to a significant Condition main effect, $F(2,84)=5.11$, $p<.03$ there was a significant N x Condition interaction, $F(3,84)=5.02$, $p<.03$. Regression plot revealed that hi N participants exhibited the greatest increases in negative mood after writing about their cancer experience. Simple slope analysis revealed non-significant relationships between Neuroticism and negative mood change (p's$>.1$).

Neither avoidance nor negative mood change significantly affected the neuroticism by condition interaction on distress which remained significant after controlling for

avoidance and mood change respectively, $F(1,87)=11.12$, $p=.001$; $F(1,84)=17.47$, $p<.001$ suggesting that neither of the variables could explain the interaction effect.

Moderating Role of Extraversion

Similar analyses were conducted using Extraversion as a moderating variable. In addition to the significant association between baseline and Time 2 GSI, there was also a significant main effect of Extraversion on GSI, $F(1, 85)=4.84$, $p<.05$ with high extraversion being associated with low GSI at follow-up. The extraversion by condition interaction was also significant, $F(1,83)=6.43$, $p=.01$ such that participants high in E were less distressed six months after emotional disclosure than those who had low E. Simple slope analysis revealed a significant negative relation between extraversion and distress, $t=-2.86$, $p<.01$ in the experimental condition with no significant effect in the control condition.

Next we examined whether extraverts would be more likely to report positive affect in response to the emotional disclosure task. While there was a significant effect of experimental condition on positive mood change across the three writing days, $F(1,82)=6.50$, $p<.02$, neither extraversion nor the extraversion x condition interaction significantly predicted positive mood change (p's$>.1$).

Finally we examined the effect on avoidance one week after writing, predicting that extraverts would show either no increase in avoidance after emotional disclosure or a decrease. There was a significant main effect of baseline avoidance on avoidance one-week post-writing, $F(1,87)=34.81$, $p<.001$ and a significant main effect of extraversion on avoidance, $F(1,84)=4.84$, $p<.05$, suggesting high extraversion to be associated with low avoidance. However, the extraversion by condition interaction was not significant, $p>.1$.

We also examined other possible mechanisms including change in other coping strategies, and characteristics of the essays subjects wrote such as number of negative and positive emotion words, cognitive words and change of these categories over the three writing sessions. None of these proposed mechanisms was a significant factor in explaining the above relations.

The manuscript detailing the above findings is currently in preparation. A preliminary version of these findings was presented at the International Society of Behavioral Medicine, Helsinki, Finland, August 2002.

Additional findings:

Findings that were previously presented or published include smaller samples of the present pool of participants as well as a sample of prostate cancer patients from a comparable study.

1. Emotional expression is an important means of coping with stressful experiences such as cancer. Social barriers to expression may have adverse effects. Research has suggested that men are less likely to express their emotions and have different patterns of social support compared to women. We examined whether male cancer patients have a lower tendency to express emotions, are less likely to perceive social barriers to expression, and are differentially affected by social barriers from different support sources as compared to women. Questionnaires were administered to 41 gynecological cancer patients and 41 prostate cancer patients using baseline data from the intervention

project. There was a trend towards greater emotional expressivity in women as compared to men but no significant gender differences in perceptions of social constraints from spouse/partner or others. Multiple regression analyses revealed that men experienced significantly greater distress in association with social constraints from their spouse/partner than did women. Men may be more vulnerable to social barriers to expression than previously assumed. Gender differences in emotional expressivity may be less important than the social context in which expression takes place (Zakowski, et al., 2003).

2. Individuals facing the stress of cancer often rely on their social networks to allow them to express their thoughts and emotions in an effort to cope with their illness. However, these efforts are sometimes met with negative responses that inhibit their emotional expression (i.e., social constraints) which in turn may lead to increased distress. We hypothesized that expressive writing would buffer the distress associated with such social barriers. Patients diagnosed with cancer (N=103) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about their cancer experience for 20 minutes a day for three consecutive days, or a control group who wrote about non-emotional topics. Patients (49% male) were ages 25-84, 95% Caucasian, 81% married, and had been diagnosed with prostate or gynecological cancer. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), and the Social Constraints Scale (SCS) at baseline. Multiple regression analysis regressing Time 2 distress on baseline distress, SCS, Group, and SCS x Group revealed a significant SCS x Group interaction ($p=.015$) indicating that expressive writing buffered the distress associated with social constraints. These findings suggest that cancer patients whose social network responds negatively to their efforts to express their emotions regarding their cancer may be most likely to benefit from a writing intervention. Patients who encounter few such social barriers may have less of a need for additional emotional outlets. This underscores the importance of matching psychological interventions to patients' needs (Zakowski, et al., 2004).

3. Repressive coping marked by a dispositional tendency to suppress disclosure of negative emotions may have adverse effects including increased physiological responses to stressors and progression of disease in cancer patients. We examined whether repressors are less likely to benefit from an expressive writing intervention compared to non-repressors (classified according to Marlowe-Crowne Social Desirability Scale (MCSDS)/Taylor Manifest Anxiety Scale (TMAS)). Patients diagnosed with prostate or gynecological cancer (N=109) within the past five years were randomly assigned to an experimental group, who wrote about their deepest thoughts and emotions about cancer for 20 minutes a day for three days, or a control group who wrote about non-emotional topics. Patients (51% female) were between the ages of 25-84, 95% Caucasian, 81% married. They completed the Brief Symptom Inventory (BSI, distress) at baseline and 3 months post-intervention (Time 2), the TMAS, and the MCSDS. Multiple regression controlling for baseline distress revealed main effects for social desirability and trait anxiety predicting Time 2 distress ($p's<.01$). A TMAS x MCSDS x Group interaction ($p<.04$) revealed that repressive copers (high desirability/low anxiety) benefited the least from the intervention, whereas truly low anxious patients and patients high on anxiety and social desirability benefited the most. Repressed copers may prefer other means of

coping with stress and thus not benefit from interventions that focus on emotional expression. Individual differences should be considered when implementing interventions.
These findings were presented at the Society of Behavioral Medicine conference, Washington, D.C., April 2002.

5. We examined predictors of quality of support provision among spouses of gynecological cancer patients. Forty-eight gynecological patients and their spouses were assessed at one time-point for personality variables, social constraints, and distress. We found that spouses' neuroticism was significantly associated with social constraints (as perceived by the patient). This association was partly explained by spouses' higher levels of distress and social constraints from an outside network. These findings suggest that a spouse's personality trait of Neuroticism may contribute to their inability to provide support to a patient due to the heightened levels of distress they are experiencing.
These findings were presented at the APS meeting in April 2003.

6. Life-threatening events challenge one's schema about personal vulnerability. Emotional expression is associated with adjustment to such events possibly by assimilating the information of vulnerability with existing cognitive schemas. Assimilation may occur by changing the meaning of the threat and reducing the individual's sense of vulnerability. We examined whether emotional disclosure about patients' cancer experience would result in reductions in perceptions of vulnerability (e.g., risk of recurrence). Gynecological (n=69) and prostate cancer (n=69) patients who had completed active cancer treatment, diagnosed within the past 5 years were randomly assigned to write about their emotions regarding their cancer experience or about their daily activities (controls). They completed a Perceived Risk Scale (PRS) and Impact of Events Scale at baseline, 3 and 6 months post-writing. Groups were comparable on demographic and medical characteristics. The PRS, developed for this study, consists of 2 subscales, perceived risk for poor cancer prognosis and worry about risk. Repeated measures ANCOVA revealed a significant time main effect ($p<.05$) and a significant condition by time interaction ($p=.02$). Perceptions of risk increased over time but this was moderated by condition. Patients who wrote about their cancer showed less of an increase in risk perceptions than controls. Risk perceptions were significantly correlated with worry and intrusive thoughts about cancer (r's=.38 to .48) suggesting that perceptions of risk play a significant role in psychological adjustment to cancer. Neither worry nor intrusive thoughts changed as a function of writing condition. Emotional disclosure buffered the increase in perceived risk that patients were experiencing over time. Patients' vulnerability may increase as they are no longer under constant medical supervision. Emotional disclosure may be an effective intervention to prevent this increase.
These findings were presented at the Third International Conference on the (Non) Expression of Emotions in Health and Disease in Tilburg, The Netherlands, October 2003.

7. Social barriers to expression (i.e. social constraints) from one's social support network appear to inhibit cognitive processing following diagnosis and treatment of cancer. Cross-

sectional research has reported differential effects of constraints on intrusions and distress for men and women with cancer, such that constraints from spouses have been shown to affect men more strongly than women. These findings suggest that men may rely on their spouses more heavily than women, while women may more often seek support outside their marriages. The present study sought to support these findings prospectively, and to more specifically examine amount of talking about cancer with spouse versus others. Prostate (n = 98) and gynecological (n = 138) cancer patients completed questionnaires on social constraints from and amount of talking about cancer with spouses and others, intrusions and distress at two time points. *T*-tests and hierarchical regression analyses were used to test hypotheses. A significant Constraints-Spouse effect emerged [*Beta* = 1.02, $p < .01$], such that higher constraints were associated with greater distress. More importantly, a significant Constraints-Spouse x Gender effect was found [*Beta* = -1.12, $p < .01$] such that, for men, constraints predicted 14.2% of the variance in distress, whereas for women, it predicted for only 2.6%. A nonsignificant trend for Constraints-Others x Gender emerged for intrusions [*Beta* = -.37, $p = .08$] such that constraints were more strongly related to intrusions for women than men. Lastly, women reported talking about their cancer with others more than men ($p < .01$), whereas no gender differences were found for talking with spouses ($p = .25$).

These findings were presented at the conference of the Society of Behavioral Medicine in Baltimore, MD, in March 2004.

8. Written emotional disclosure of trauma has been associated with improvements in a person's psychological adjustment. Pennebaker developed a text analysis tool (LIWC) to determine if language use (e.g., cognitive word usage) may be related to these benefits. Another potential method of text analysis looks at level of emotional awareness (LEA). Emotional awareness is the capacity to be consciously aware of emotion and to constructively use emotional information. Lane and Schwartz (1987) proposed that EA undergoes 5 levels of increasing structural transformation and organization in emotional experience. Using a novel application of the LEA model, we examined whether patients exhibiting a higher LEA in their essays reported fewer intrusive cancer–related thoughts (INTR) post-writing. We also compared the 2 text analysis methods (LEA vs. LIWC) in predicting INTR post-writing. Gynecological (n = 20) and prostate cancer patients (n = 20) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. INTR was assessed at baseline, 1-week, 3-months and 6-months post-writing. Essays were scored and rated on LEA. LIWC analysis was conducted to assess the change in cognitive words between the 1st and 3rd day of writing. Regression analyses controlling for baseline INTR showed that LEA accounted for 4.74% ($p = 0.062$), 4.87% ($p = 0.083$), and 4.64% ($p = 0.022$) of the variance in INTR at the 3 follow-up points respectively. Cognitive words, as assessed by the LIWC, accounted for 4.68% ($p = 0.079$), 4.81% ($p = 0.108$), and 3.82% ($p = 0.833$) in INTR respectively. Results suggest that methods focusing more on essay content may be better predictors of writing benefits. A greater ability to recognize and express emotions (higher LEA) may aid in the adjustment to a trauma via written disclosure. This preliminary investigation demonstrates the usefulness of a new application of the LEA model in the analysis of emotional content of personal essays.
These findings were presented at the Third International Conference on the (Non) Expression of Emotions in Health and Disease in Tilburg, The Netherlands, October 2003.

9. Emotional disclosure has been shown to be beneficial in individuals dealing with a variety of traumatic and stressful experiences. While little is known about gender differences in the effects of disclosure, it has generally been found that women are more likely to use emotional expression as a form of coping with stress than are men. It is therefore often assumed that men may be less likely to benefit from emotional disclosure. The present study investigated the effects of written emotional disclosure in male and female cancer patients. Using Pennebaker's writing paradigm, 80 gynecological cancer patients and 84 prostate cancer patients were randomly assigned to two conditions. In the disclosure condition participants wrote about their emotions regarding their cancer experience for 20 minutes a day for three consecutive days. Controls wrote about their daily activities. Moods (POMS) were assessed at baseline, three, and six months post-writing. A 2 (gender) by 2 (condition) repeated measures ANOVA revealed a significant gender by condition interaction ($p<.01$). Inspection of means showed that while women exhibited little change in response to the disclosure intervention, men reported reduced mood disturbance at six months post-intervention. Women may have other emotional outlets possibly in their social environment that mask the effects of writing. The results suggest the value of implementing interventions that provide male cancer patients with a means to express their emotions.

These findings were presented at IPOS, Denmark, August 2004.

10. Past research has provided evidence that written emotional expression after experiencing a traumatic event results in decreased distress and improved mental health. However, other research has suggested that if the emotional disclosure occurs immediately following the stressful event the effects to the individual are either not helpful or detrimental. To date, little research has examined the specific point in time, following trauma, where written emotional expression is most beneficial. This study hypothesized that benefits of expressive writing depend on time of intervention (relative to the time since diagnosis of cancer). Participants included 39 Prostate and 38 gynecologic cancer patients who were recruited post-treatment within five years of their cancer diagnosis. The mean age for participants was 58.9 years and 94.8% of participants were Caucasian. The stage of diagnosis ranged was reported for % of the patients with gynecological cancer and scores ranged from 1 to 4 (Stage 1 = %, Stage 2 = %, Stage 3 = %, Stage 4 = %). Gleason scores (GS) were available for 56% of patients with prostate cancer and ranged from 4 to 9 (GS4 = 5%, GS5 = 5%, GS6 = 55%, GS7 = 23%, GS8 = 9%, GS9 = 5%). Participants were contacted to participate by both phone and mail. After completing baseline measures of mood assessment (Profile of Mood Scale, POMS), participants were asked to write about their cancer experience for twenty minutes a day for three consecutive days in the privacy of their own homes. The POMS was again administered 3 and 6 months following the writing intervention. Days since diagnosis ranged from 61-1,837. Early (61-285 days), middle (286-544 days) and late (over 544 days) intervention groups were formed via tertile splits on days from diagnosis to commencement of the emotional writing intervention. Between-groups baseline POMS differences were not found ($p=.60$). A 3 (Time of Intervention: early, middle, late) x 3 (Assessment: baseline, 3-months, 6-months) mixed-model ANOVA revealed a significant Time of Intervention x Assessment effect ($p<.05$). Simple effects analyses revealed decreases in total mood disturbance (as measured by POMS) from baseline to 3-months ($p=.06$), 3- to 6-months ($p=.07$) and baseline to 6-months ($p=.04$) for the early intervention group. Significant effects were, however, not evident for middle or late intervention groups for any epoch. These results suggest that time of intervention does affect the level of benefit gained from emotional expression through writing. Specifically, there is evidence that emotional writing tasks which take place between 60 and 285 days after cancer diagnosis are more beneficial than those which occur after this time span. Additional research needs to examine the effects of writing tasks which take place immediately after a stressful event has occurred (i.e., from 0-60 days).
These findings were presented at the APS meeting in Chicago, Illinois, in March 2004.

11. Empirical data and theoretical propositions have recently underscored the importance of positive marital interactions and spousal social support in psychological adjustment to diagnosis and treatment of cancer. Conversely, negative marital interactions and deteriorated spousal support provision appear to be related to poor psychological adjustment. In this study, we examined the predictive effects of patient personality and gender on one form of negative marital interactions that is both theoretically and empirically linked to particularly poor psychological adjustment: *spousal social constraints*. Spousal social constraints are barriers imposed on the expression of cancer-

related emotions by a patient's spouse. Based on existing data on the pernicious effects of repeated distress expressions on the part of the patient on the quantity and quality of support provision, we suggested that patients who tend to frequently experience significant levels of negative emotion (e.g., high neuroticism) *and* express their emotion (i.e., high emotional expressivity) would show the greatest increases in spousal social constraints over time. Owing to gender differences in support seeking and provision, emotional expression, and levels of negative emotionality, we also examined whether patient gender further moderated the hypothesized effects. Results revealed a significant Neuroticism X Emotional Expressivity X Gender effect, such that *only* female patients who reported a tendency to frequently experience negative emotion *and* to express emotion fostered the greatest increases in spousal social constraints. Directions for future research were highlighted; for instance, observational measurement (versus self-report) of dyadic interactions among patients and their spouses is sorely needed. Potential clinical implications were also discussed; for example, interventions aimed at changing emotion expressive tendencies among female cancer patients, or, conversely, increasing capacity of male spouses' ability to respond empathically and with greater positive regard to their spouses' (i.e., patient) distress expressions (Quartana et al, 2006).

12. Although predictors of socially imposed constraints on expression of emotion (i.e. social constraints) are not fully understood, existing research suggests that long-term caregiving for ill individuals may engender a deterioration of support provision, especially if the patient who is cared for exhibits high levels of worry about his/her illness (i.e. perceived threat of recurrence, threat of death). These findings lead to the hypothesis that contrary to what research typically suggests, threat appraisals may be an *antecedent*, rather than a consequence, of social constraints on emotional expression. The present longitudinal study sought to test this reverse causality hypothesis. Married prostate (n = 47) and gynecologic (n = 28) cancer patients completed questionnaires that assessed cancer-related threat appraisals and perceived social constraints from their spouse at both an initial assessment (Time 1) and a 3-month follow-up (F/U). Using a cross-lagged panel design, a significant Time 1 patient appraisal and F/U social constraint (p<.01) and a nonsignificant Time 1 social constraint and F/U patient appraisal (p = .16) correlation emerged. Hierarchical regression analyses revealed that after controlling for T1 constraints and F/U appraisal, Time 1 patient appraisal accounted for significant variance in F/U social constraints (p<.05). These finding support our hypothesis that initial levels of patient threat appraisal may predict later levels of perceived spousal constraints, not vice versa. This underscores the need for psychosocial interventions aimed at minimizing worry about their prognosis in cancer patients.
These findings were presented at the Society of Behavioral Medicine conference in Boston, MA, April, 2005.

13. Research investigating the nature of emotion has demonstrated that there are considerable individual differences in emotional experience. Some individuals exhibit a tendency to experience emotion in a more global and undifferentiated manner, lacking the emotional awareness and clarity to discern the particular emotion s/he is feeling. Conversely, some individuals experience emotion in a more discrete and differentiated manner and are fully aware of the specific feelings evoked by the experience. According

to the affect-as-information theory, emotions embody information relevant to the personal significance of a situation. This knowledge is helpful in determining what future course of action should be taken not only to remedy the problematic situation but also to change how one feels, i.e., emotion regulation. This suggests that individuals who have the capacity for a more highly emotionally differentiated experience may have the beneficial advantage of having more highly discrete emotional information on hand during the representation and processing of the event than those whose emotional experiences are more global. Therefore, the former may be better able to consequently regulate their emotions. A study conducted by Feldman Barrett & Gross (2001) found evidence for just this hypothesis. Specifically, their results showed that emotion differentiation (ED) for negative emotions was positively associated with frequency of negative emotion regulation (ER) strategies used. The goal of the current study was to test a similar hypothesis using a clinical population. It was hypothesized that cancer patients, after writing about their deepest feelings regarding their cancer experience, and who showed a more highly emotionally differentiated experience, would report using a greater frequency of coping strategies to deal with their illness. Furthermore, it was hypothesized that level of ED and frequency of coping strategies (COPE) used would predict level of mood disturbance (POMS). Gynecological (n = 29) and prostate cancer patients (n = 33) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. Based on procedures used by Feldman Barrett & Gross (2001), an ED index (EDI) was calculated for each participant based on his/her mood experienced immediately after writing; mood being assessed using a series of 7 negative affect terms on a 5-point Likert scale. Higher EDI scores reflected larger correlations between affect terms and thus, a smaller level of ED. COPE and POMS were assessed 1-week after writing. Correlational analysis showed a negative association between EDI and COPE (r = -0.28, p = 0.03), suggesting that patients reporting greater ED reported utilizing a greater frequency of coping strategies than patients with a lower ED. Regression analyses controlling for baseline mood showed that EDI and COPE accounted for 8.4% ($p < 0.01$) of the variance in POMS at the 1-week follow-up. Overall results suggest that one's tendency to experience emotional events in either a more global or more discrete fashion may be an important consideration in predicting how many coping strategies s/he may engage in to deal with a traumatic event, such as having cancer. This may have important implications in his/her mood and future psychological adjustment. These findings were presented at the annual conference of the American Psychological Society in Los Angeles, May, 2005.

14. Reasons to explain the beneficial effects of written emotional disclosure (ED) of traumas on psychological adjustment remain unclear. One hypothesis proposed that the cognitive processing involved in ED allows for exploration of personal meaning of the trauma, thus facilitating psychological adjustment. Some data suggest that increase in cognitive words over time, presumably reflective of increased cognitive processing, is associated with fewer distressing trauma-related intrusive thoughts. Another hypothesis proposed that level of emotional awareness (LEA) might be another important factor for the insightful processing of the emotional experience. To date, most studies have examined *isolated* theories in explaining the effects of ED. The current study proposes that a *combination* of cognitive processing (evidenced by increased usage of cognitive

words [CWs]), AND having significant emotional contact (facilitated by greater EA) may be essential for beneficial ED. According to the affect-as-information theory, emotions embody information relevant to a situation's personal significance. Thus, being aware of the particular emotions evoked from the trauma would provide information helpful in the cognitive processing of the trauma (e.g., making sense of causes and implications) as well as in regulating those emotions. Using a novel application of the LEA model (Lane, 1990) to score essays on LEA, the current study examined whether LEA moderated the relationship between change in CWs and frequency of cancer-related intrusive thoughts [INTR]. It was hypothesized that patients, who showed an increase in CWs used in essays regarding their cancer experience, would report a lower number of INTR, especially if they exhibited high EA in their essays. Conversely, participants who decreased their CW usage and used low LEA should report the greatest number of INTR. Cancer patients (n = 56) wrote for 20 minutes for 3 consecutive days about their emotions regarding their cancer experience. INTR was assessed at baseline and 6-months post-writing. Essays were scored and rated on LEA. LIWC analysis was conducted to assess the change in CWs between the 1st and 3rd day of writing. Regression analyses controlling for baseline INTR showed a trend for the moderating effect of EA on the relationship between change in CW usage and INTR, F-change (1, 54) = 3.562, $p = 0.065$. Simple slope analysis provided partial support for our hypothesis, i.e., patients who exhibited lower LEA *and* who showed a decrease in CWs reported greater frequency of INTR versus those exhibiting a greater LEA with a comparable decrease in CWs. Surprisingly, there were no significant differences in INTR with increase in CWs between patients exhibiting lower LEA vs. those exhibiting higher LEA. The latter finding supports past findings emphasizing the importance of having insight into the personal significance of the trauma and suggests that for these patients, EA did not play as a big a role in predicting INTR. Further investigation is warranted. Overall, consideration of factors such as an individual's ability to draw personal insight from his/her trauma as well as his/her LEA is important in determining the degree of potential benefits s/he may gain from written ED. These findings were presented at the annual conference of the American Psychological Society in Los Angeles, May, 2005.

Conclusions:

The expressive writing intervention was not equally effective in all participants recruited to date. Individual differences in benefits were found, such that individuals low on trait Neuroticism were most likely to benefit from the intervention. No mechanisms for the effect have been identified.

In comparison to female cancer patients, prostate cancer patients report greater distress in association with social constraints; expressive writing is associated with lower perceived threat of recurrence; expressive writing buffers the negative effects of social constraints; repressive copers and neurotics benefit less from expressive writing; men benefit more from writing; time of intervention relative to diagnosis of disease determines its benefits; spouses' neuroticism interferes with social support given to the patient.

Overall the present study has provided valuable information about the relations between emotional expression, personality, and psychological adjustment in cancer patients. We were able to demonstrate the feasibility of administering the intervention by phone ad mail which is a more user friendly, cost-effective way of conducting the intervention and can reach a larger number of patients who may not be able to benefit from more extensive interventions that require a greater time and financial commitment. The intervention clearly benefits a subsample of patients, those who have little interpersonal support, and those with a certain personality characteristics. This raises important questions for future research including, mechanisms for the effects, and how can those patients be served that do not benefit from our intervention. The findings have significant implications for clinical interventions as well as future research in the field of psycho-oncology.

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